

# Landscape scale Disaster Risk Reduction

## And the role of wetland ecosystems

90% of all hazards are water-related. To effectively address disaster risk, it is fundamental to understand how water behaves in the landscape, how factors such as infrastructure, vegetation, land use and climate change influence water flows, and to connect all water users and stakeholders. We work on initiatives to transform landscapes into safer and more prosperous environments.

### Public private sector collaboration in Java

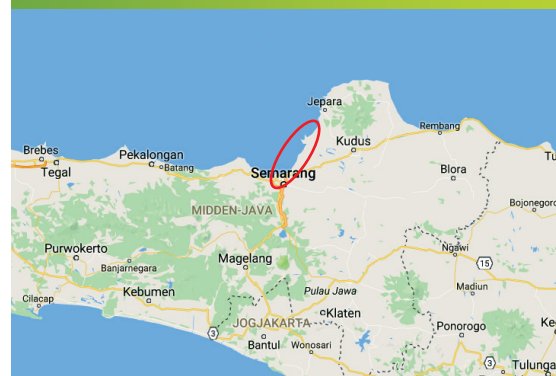
Northern Java's shorelines suffer from the consequences of erosion hazards. 6 kilometers of land inwards might be lost in 2100. The agriculture and aquaculture sectors suffer multi-billion losses and infrastructure investments are at risk.

Hard infrastructure solutions are ineffective in these rural mud coasts, are expensive and not capable to adapt to expected sea level rise. As an alternative, we are implementing 'Building with Nature' solutions to halt land loss and revitalize aquaculture, working at a landscape level with the dynamics of nature. These solutions are flexible, adaptive and provide multiple benefits to local communities.

Through collaboration across sectors and disciplines, we connect local expertise with context specific knowledge on engineering, aquaculture and natural ecosystems.

### Case Focus:

- Region: Central Java, Indonesia
- Risks: coastal erosion
- People affected: 70,000 in Demak, millions across Java
- Ecosystems: mangroves, sea grasses, reefs
- Land use: aquaculture, industry



### Interventions:

- Restoring the sediment balance to facilitate the regeneration of a wide mangrove belt
- River restoration and better use of surface water
- Introducing sustainable aquaculture
- Training of water sector
- Integration into policy



**Wetlands**  
INTERNATIONAL



Local woman in Demak dealing with floods.  
Photo by Nanang Sujana

### Public private collaboration:

- The Indonesian government partners create an enabling environment and ensure alignment with their coastal management and development programmes.
- Wetlands International manages the partnership, coordinates field activities, empowers local communities, facilitates dialogues with government and other stakeholders and contributes ecological expertise. NGO Blue Forest organizes coastal field schools to develop aquaculture measures with communities.
- Knowledge institutes Deltares, Wageningen University & Research and University of Diponegoro coordinate the design and monitor the trainings by UNESCO-IHE.
- Engineering firm Witteveen+Bos coordinates implementation of coastal safety engineering measures by Indonesian contractors, prepares the Business Case, develops the guidelines and facilitate project replication.
- Design, implementation and maintenance of field measures is done by local communities where possible.

### Economic losses in Demak

- Losses in ecosystem services under a business as usual scenario: 4000 US\$ per ha/year, surpassing a combined 2,2 billion annually by 2050.
- 60-80% and 25-50% loss of income for shrimp farmers and fishermen respectively over the last decade.
- 70.000 people in Demak lost roads, schools and ponds. Loss of 1000 ha of land, including two villages.

Jane Madgwick, CEO Wetlands International:

*"Building with Nature platforms are a crucial means for intensive dialogue, building trust and establishing partnerships across research organisations, civil society, companies, government and communities to broker solutions that benefits all stakeholders."*

### Building with Nature solutions

We construct permeable dams that dampen the waves and trap sediment to regenerate mangroves for erosion control. We invest in river restoration and better use of surface water to address land subsidence which results from ground water extraction from deep wells.

By developing sustainable aquaculture, we give a boost to the local economy. The interventions will be governed under community laws and integrated in community development plans and government master planning.

### Replication

This pilot inspires and informs replication across the wider coastline of Northern Java. Our ambition is that globally this way of working with natural processes becomes the dominant approach to tackle water challenges alongside other measures of risk reduction.

More information at [www.wetlands.org](http://www.wetlands.org) and [www.indonesia.buildingwithnature.nl](http://www.indonesia.buildingwithnature.nl).

